Project Introduction

This proposal discusses the development and application of new methods of structural-acoustic analysis in order to address existing problems in aircraft interior noise prediction. The proposed methods are based on a hybrid modeling strategy that combines Finite Element Analysis (FEA) and Statistical Energy Analysis (SEA). Over the past five years, Vibro-Acoustic Sciences has devoted a considerable research effort towards the development of a framework for combining these two analysis methods. Recent research carried out by over the past two years has resulted in the development of a rigorous solution to this problem. The resulting Hybrid approach has been derived in general terms and validated for a number of simple structural-acoustic problems. However, the method has not yet been applied to aircraft interior noise prediction. A number of candidate aircraft interior noise problems have been identified which would benefit greatly from the use of the Hybrid method. The aims of the research described in this proposal are therefore: (i) to demonstrate the application of the Hybrid method to a number of existing aircraft interior noise problems, (ii) to develop the method to ensure it contains sufficient functionality to address practical aircraft interior noise problems and (iii) to demonstrate the value of the method in the prediction and reduction of noise in airframe systems.

Primary U.S. Work Locations and Key Partners
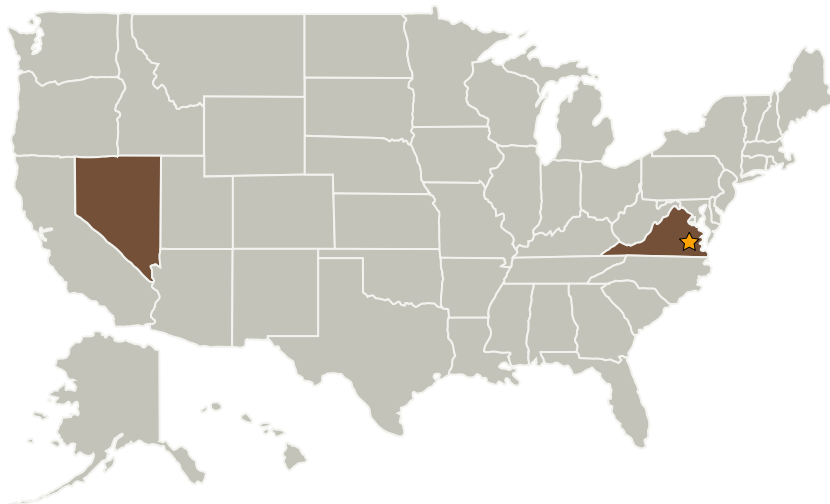

Hybrid Prediction Method for Aircraft Interior Noise, Phase I

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Organizations Performing Work	Role	Type	Location
⭐Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
🟢Early Stage Innovations(ESI)	Supporting Organization	NASA Other	

Primary U.S. Work Locations	
Nevada	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bryce Gardner

Technology Areas

Primary:

- TX04 Robotic Systems
  └ TX04.2 Mobility
    └ TX04.2.5 Robot Navigation and Path Planning

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